

Freedom from Powerpoint

An introduction to creating clear, structured, & efficient presentations & notes for conferences and lectures with $\text{\LaTeX} 2_{\epsilon}$ and *Beamer*

Simon Angus

School of Economics

11 October, 2006

Agenda

- The problem;
- Introduction to A Better Way;
- The Beamer system;
- Fancy stuff;
- Some considerations 'from the field'.

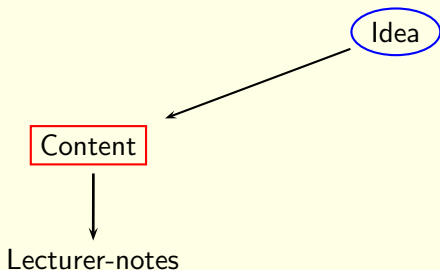
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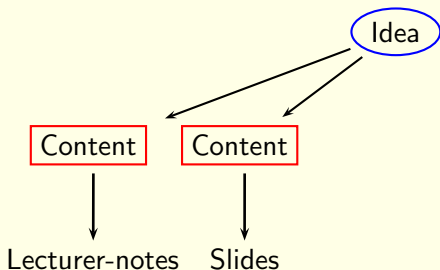
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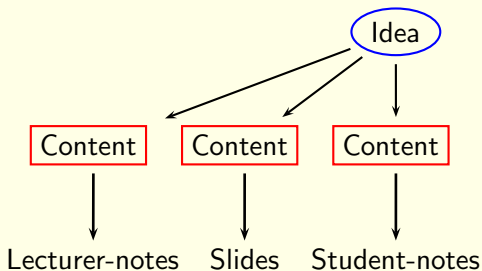
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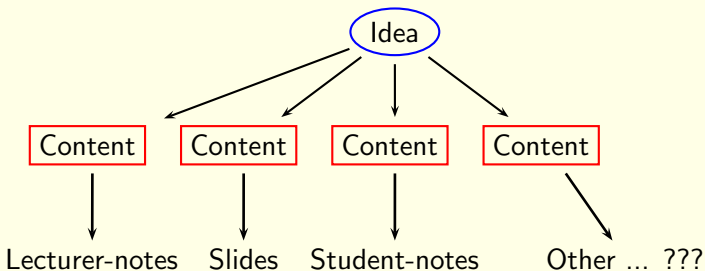
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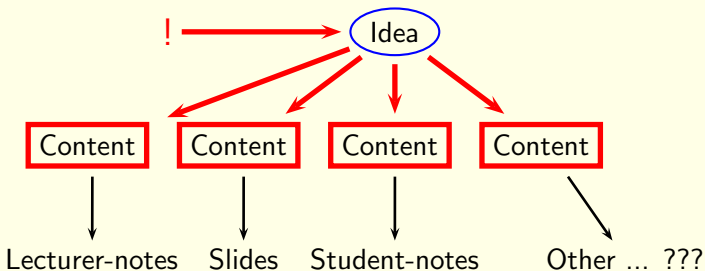
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- ⑥ Fonts can go 'weird' .. not standard libraries between computers.

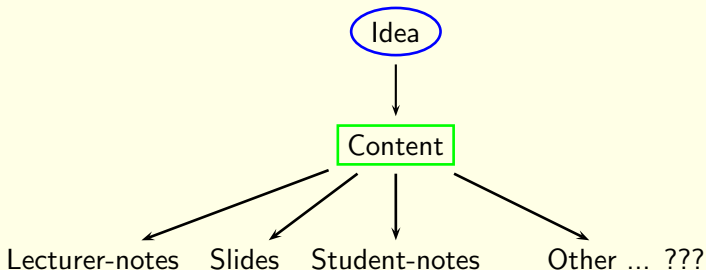
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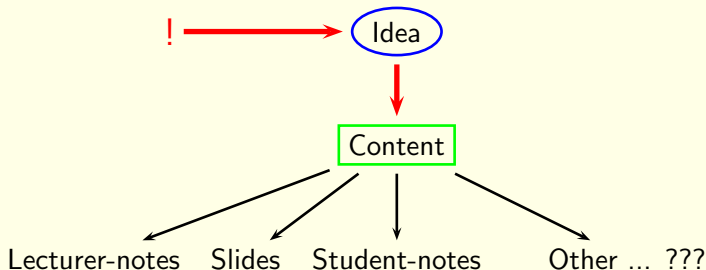
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- 5 PDF format is native output, giving far less font problems;
- 6 That *shmick* appeal (!) at conferences, and with students ...

Additional features

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- Fancy extensions: ps-tricks, books etc.

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- By far the greatest advantage of the $\text{\LaTeX} 2_{\epsilon}$ approach combined with Beamer is that you only have to write the material **ONCE**...
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- This one document is then used to produce all the other kinds of output...
- How is this achieved?

Under the hood: The basic document

```
1 \documentclass[<options>]{beamer}
2 \usetheme{Frankfurt}
3 \title{My Presentation title}
4 \author{Simon Angus}
5 \date{\today}
6 \begin{document}
7 % ----- %
8 \frame{\titlepage}
9
10 \section{Introduction}
11 % ----- %
12 \frame{\frametitle{The first slide}
13       \begin{itemize}
14         \item Here is a list of points;
15         \item That I am making for the;
16         \item Audience to pay attention to;
17       \end{itemize}
18 }% eof
19 % ----- %
20 \frame{\frametitle{The Next slide}
21       Some more text
22       ...
23 }% eof
24 \end{document}
```

Then..

- Once the basic content is written, then the real muscle begins!
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1 \documentclass[<options>]{article}
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- ... and the document is made into an article format instantly.
- What about slide-handouts, or transparencies??

```
1 \documentclass[handout]{beamer}
2 or,
3 \documentclass[trans]{beamer}
```

The Overlay

- Often we want to reveal text (or maths, or diagrams) in a piece-wise manner;
- This is achieved through **overlays**:
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```

- Or,

```
\only<4>{Only know about this and show it on}
```

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```

1 \item<3-> Question: What is the derivative of  $x^3$ ?
2 \mode<presentation>{%
3   \item<4-> Answer: the derivative is given by the {\sf power-rule} as
4     follows ,
5     \[
6       \frac{d}{dx} x^3 = (3)x^{3-2} = 3x^2
7     \]
8   }% mode

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- Answer: the derivative is given by the power-rule as follows,

$$\frac{d}{dx}x^3 = (3)x^{3-1} = 3x^2$$

A change is ...

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- There are lots of ready-made themes to use.
- The current one is called Frankfurt.
- See it in AnnArbor, CambridgeUS, Marburg ...

```
\usetheme{AnnArbor}
```

Being clear about definitions

`\defit{<title>}{<definition>}`

Definition: *The Definite Integral*

To find the numerical value of an integral $\int f(x) dx$ over the interval $x = (a, b)$, where $b > a$, we calculate the **definite integral** written,

$$\int_a^b f(x) dx = F(x) \Big|_a^b = F(b) - F(a) \quad (1)$$

where b and a are the **upper limit of integration** and **lower limit of integration** respectively.

```

1 \defit{The Definite Integral
2 }{%
3   To find the numerical
4     value of an integral
5      $\int f(x) dx$  over
6     the interval  $x=(a,b)$ 
7     $, where  $b>a$ , we
8     calculate the \key{
9       definite integral}
10    written ,
11
12    \beq
13      \int^b_a f(x) dx = F
14        (x)\over^b_a = F(b
15          ) - F(a)
16
17    \eeq
18    where $b$ and $a$ are the
19      \key{upper limit of
20        integration} and \key{
21          lower limit of
22            integration}
23      respectively .
24
25    }% def

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The example class

`\solveit{<title>}{<problem>}{<solution>}`

Example (Definite Integrals)

Suppose $f(x) = k(1 - e^x)$, find $\int_a^b f(x) dx$
(k is a constant).

```

1 \solveit{Definite Integrals}{
2   % problem
3   Suppose  $f(x) = k(1 - e^x)$ ,
4     find  $\int_a^b f(x) dx$ 
5     ( $k$  is a constant).
6 }{% solution
7 \vis<2->{%
8   We solve as normal, but
9   being careful of the
10  constant,
11
12  \bea
13    \int_a^b k(1 - e^x) dx
14    &= k \left( x - e^x \right) \Big|_a^b \\
15    &= k (b - e^b) - k(a - e^a) \\
16    &= \text{\sol}{k(e^a - e^b + b - a)}
17  \eea
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$$\begin{aligned} \int_a^b k(1 - e^x) dx &= k(x - e^x) \Big|_a^b \\ &= k(b - e^b) - k(a - e^a) \\ &= k(e^a - e^b + b - a) \end{aligned}$$

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14    &= k\left(x - e^x\right)\over^b_a \\
15    &= k(b - e^b) - k(a -
16    e^a) \\
17    &= \sol{k(e^a - e^b +
18    b - a)}
19  \eea
20 }% vis
21 }% sol

```

Don't go there...!

`\alertit{<title>}{<content>}`

Caution!

The definite integral, calculating the area between the function and the x-axis,

$$\int_a^b f(x) dx$$

will give a **positive** area for regions **above** the x-axis, but a **negative** area for regions below the x-axis.

```

1 \alertit{}{%
2   The definite integral,
   calculating the area
   between the function
   and the x-axis,
3   \[
4     \int^b_a f(x) dx
5   \]
6   will give a {\color{blue}
   positive} area for
   regions \bb{above} the
   x-axis, but a \alert{
   negative} area for
   regions below the x-
   axis.
7   }% alert

```

Other useful tools

Extra-Lecture Notes Can be added with

```
\noteit{<title>}{<note>}
```

which is a good way to add explanations or descriptions in greater detail (e.g. that may not be adequately covered by the text);

Chapter References Directing a student to the relevant part of the text seems a good way to encourage effective studying habits:

```
\chap{4.2}
```

Highlighting Keywords One of the nice things about tag-based writing is that you can collect key terms for an **index**:

Now this `\key{key concept}` will be added to the **index**.

The very nice world of tagged text...

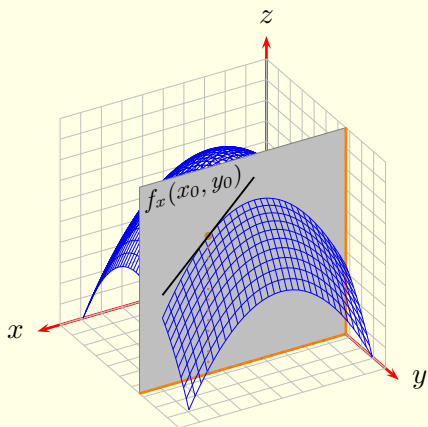
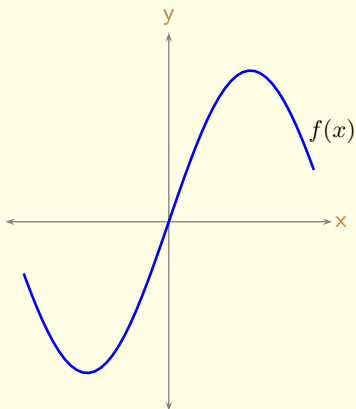
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- Even books of lectures (e.g. QMA).

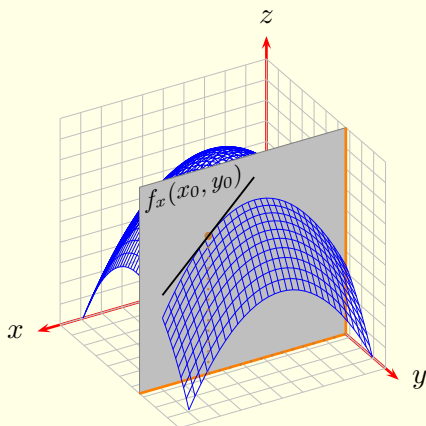
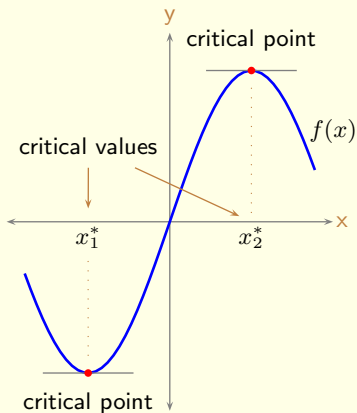
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- Teaching style – presentations, board, notes (multimedia?)??

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- I'm here.